

OCGC Seminar

The Archean-Proterozoic transition and emergence of modern-type plate tectonics

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Geological Association of Canada 2022 Howard Street Robinson medalist

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Carleton University

Herzberg Laboratories

Room 3120 HP

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Chambre 3120 HP

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The Archean-Proterozoic transition between ca. 2.5 and 1.8 billion years ago was characterized by fundamental transformations in the scale and style of plate tectonics, introducing, for the first time in Earth's history, processes that more closely resembled those found in modern environments. These processes include continental margin rifting and eruption of continental flood basalt, establishment of passive continental margins, arc and back-arc magmatism, generation of supra-subduction zone ophiolites, as well as accretion of juvenile terranes and micro-continents. Elements of modern-type continent-continent collision also emerged, such as indentation tectonics, formation of oroclinal arcs, as well as deep exhumation of continental crust and escape tectonics. This lecture focuses on the Trans-Hudson orogen, which has preserved a ~ 270 m.y. long, near-complete record of ocean opening, closure, accretion, and collision spanning from Saskatchewan to the North Atlantic coast and beyond. We will also see how thick, cold sub-continental lithospheric keels acquired during the Archean played a role in subsequent tectonics and preservation of continental crust.

Dr. David Corrigan completed his B.Sc. in geology at the University of Ottawa in 1986, followed by a M.Sc. degree at Dalhousie University in 1990. He then completed a PhD degree in 1995 at Carleton University, where he was awarded the Senate Medal for Academic Achievement. This was followed by a Post-Doctoral research position at Memorial University. In 1997 Dr. Corrigan was hired as Research Scientist at the Geological Survey of Canada, where he led a number of multidisciplinary geoscience projects in the Trans-Hudson orogen and bounding Archean cratons. This research forms the foundation of his research on early manifestation of modern-type tectonic processes during the Proterozoic era. He recently retired from the GSC and presently works as a consultant for the mineral exploration industry.

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